TITLE OF THE INVENTION

ELECTRONIC COMMERCE SYSTEM AND RECORDING MEDIUM

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

5   The present invention relates to an electronic

commerce system, and, more particularly, to an electronic

commerce system which allows electronic representations to

bear exchange values.

DESCRIPTION OF THE RELATED ART

10   There exist known techniques for allowing electronic

information to include a property value and transfers goods

through buying and selling or the like via an apparatus

which performs input and output operations on the

electronic information.

15   One prior art of such techniques is an electronic

monetary system disclosed in U.S. Patent No. 5,453,601. The

contents of this patent are incorporated in this

specification by the reference.

In this electronic monetary system, a liability due to

20   overdrawing from an issuing band having an on-line

accounting system is generated by the issuing bank in the

form of an electronic representation of money.

This electronic representation includes the initial

monetary value generated, and at the time of transferring

25   this electronic representation for drawing or the like, a

transfer record having the transferred commodity value can

be included in the transferred electronic representation.

The "electronic representation" in this prior art represents an overdrawing-originated liability. When the liability is cleared by making a deposit in the overdrawn account, such an electronic representation is supposed to be cleared or invalidated.

To circulate such electronic representations as credited in the same way as promissory notes, information representing the account of the generator is included in such an electronic representation.

With an electronic representation including such information of the generator, the anonymity of the generator is hard to keep unless the generator's account can be opened anonymously. Therefore, it cannot always be said to be appropriate to use such electronic representations in transactions of a type which demands anonymity.

Even in the case where an electronic representation does not represent an overdrawing-originated liability, if generation of the electronic representation involves receipt and disbursement processes on a specific account, information on the contents of the receipt and disbursement processes remains in the electronic representation or a management record in the financial institution. Unless the account is anonymous, a problem similar to that of the case of an electronic representation indicating an overdrawing-originated liability would arise.

As a possible solution to the mentioned problem, one

can employ a scheme of circulating prepaid cards each
having recorded a personal identification number with which
points representing the balance is associated, transmitting
the personal identification number to a host computer or

5   the like which manages the points of each personal
identification number at the time of purchasing a commodity
and reducing points equivalent to the corresponding value
of the commodity then.

Transactions of prepaid cards are typically carried

10 out through trading and it is easy to keep the anonymity of
each participant in such a transaction. This scheme can
easily keep anonymity at the time the personal
identification number is transmitted as an electronic
representation.

15 An "electronic representation" in this scheme, unlike
the one in the prior art disclosed in the aforementioned
U.S. Patent No. 5,453,601, does not itself represent a
monetary value. To find out the balance, for example, it is
therefore necessary to access some means, which manages

20 points, for collation with the balance.

It is difficult to logically separate such electronic
representations from the means which grasps the current
property value of each electronic representation (e.g., the
aforementioned host computer that manages points) and

25 circulate them the way money is circulated.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention

to provide an electronic commerce system in which
electronic representations to be circulated represent
property values themselves and which keeps the anonymity of
the generator of an electronic representation and old

5   participants who dealt with the electronic notes at the
time of generating and transferring the electronic
representation.

To achieve the above object, according to the first
aspect of this invention, there is provided an electronic

10   commerce system including a network, electronic note
generation means connected to the network, contract means
connected to the network, and one or more electronic note
using means, in which system

at least one of the electronic note using means

15   includes electronic note request means for receiving
authorization information representing a generation request
for an electronic note or an electronic representation of
money and presenting the authorization information to the
electronic note generation means via the network to request

20   generation of an electronic note of a predetermined amount,
the electronic note generation means includes means
for accepting presentation of the authorization information
and a request for generation of the electronic note from
the electronic note using means, determining if the

25   authorization information represents a generation request
for the electronic note of an amount equal to or greater
than the predetermined amount, and, when determining that

such representation is true, generating and supplying the electronic note of the predetermined amount to the electronic note using means,

at least one of the electronic note using means

5   includes contract applying means for receiving and saving the electronic note of the predetermined amount, presenting the electronic note to the contract means to apply for closing of a contract for supply of a commodity,

the contract means includes contract accepting means

10   for detecting presenting of the electronic note and an application for closing of the contract from the electronic note using means and receiving an electronic note which belongs to the presented electronic note and has an amount equivalent to a price of the commodity.

15   According to this electronic commerce system, an electronic note itself represents a property value. As the electronic note that is generated by the electronic note generation means is made substantially irrelevant to the authorization information and the authorization information

20   is circulated while securing anonymity, a contract for supply of a commodity is made while keeping the anonymity of the generator of the electronic note and old participants who dealt with the electronic note.

In this invention, a "commodity" is a concept

25   including a role.

The electronic commerce system may be designed in such a way that the contract means includes:

means for calculating an excess amount which is a total amount of the electronic note received from the electronic note using means that exceeds the price of the commodity; and

5   means for supplying information indicative of the excess amount and the electronic note of an amount exceeding the excess amount to the electronic note generation means;

the electronic note generation means includes means

10   for invalidating the electronic note of an amount exceeding the excess amount, generating a first electronic note of an amount substantially equal to the excess amount and a second electronic note of an amount substantially equal to a difference between the amount of the invalidated

15   electronic note and the excess amount, and supplying the first electronic note and the second electronic note to the contract means; and

the contract means further includes means for receiving the first and second electronic notes and

20   supplying the second electronic note to the electronic note using means.

With this structure, the corresponding value of a commodity is received without overpayment or underpayment, and the balance is returned to, for example, a user.

25   The electronic commerce system may be designed in such a way that the contract means includes:

means for calculating an excess amount which is a

total amount of the electronic note received from the
electronic note using means that exceeds the price of the
commodity; and

    means for determining if the contract means has itself
5   already retained the electronic note whose total amount is
equivalent to the excess amount, and, when determining that
such an electronic note is held, supplying the second
electronic note whose total is equivalent to the excess
amount to the electronic note using means.

10   With this structure, the contract means ensures
settlement without overpayment or underpayment and without
requiring additional means for separating an electronic
note.

    The electronic note using means may have means for
15   supplying the electronic note together with separation
information representing a plurality of amounts whose total
is substantially equal to the amount of the electronic note,
to the electronic note generation means; and

    at least one of the electronic note generation means
20   and the contract means may have means for invalidating the
electronic note supplied together with the separation
information, and generating and supplying a plurality of
electronic notes having amounts indicated by the separation
information to the electronic note using means. This
25   structure allows exchange of electronic notes.

    For authorization information to represent the correct
balance, for example, the electronic note generation means

determines if the authorization information received from the electronic note using means represents a generation request for the electronic note whose amount exceeds the predetermined amount, and, after determining that the amount of the electronic note is greater than the predetermined amount, handles the authorization information as representing a generation request for an electronic note of an amount which is the predetermined amount subtracted from an amount represented before determination.

If commodities are directly providable like software, the contract means may include means for supplying the commodity to the electronic note using means.

At least one of the electronic note using means, the contract means and the electronic note generation means may have means for appending additional information to the electronic note; and

at least one of the electronic note using means, the contract means and the electronic note generation means may have means for acquiring the additional information appended to the electronic note.

In this case, the contract means may include means for acquiring the additional information appended to the electronic note and determining whether or not to receive the electronic note based on the additional information.

Specifically, the electronic note generation means may include means for appending date information indicating a date on which the electronic note has been generated, to

the electronic note;

the electronic note using means may include means for appending date information indicating a date on which the electronic note has been transferred, to the electronic note; and

the contract means may include means for determining whether or not to receive the electronic note based on the date information appended to the electronic note.

The electronic note using means may include means for appending corroboration information indicating the electronic note having been transferred, to the electronic note; and

the contract means may include means for determining whether or not to receive the electronic note based on the corroboration information appended to the electronic note.

The corroboration information may include transferor information for specifying a transferor of the electronic note and transferee information for specifying a transferee of the electronic note, the transferor information including signature information corroborating that the transferor information has been prepared by the transferor. This structure can guarantee that corroboration information is genuinely added by a transferor's manipulation or the like.

At least one of the electronic note using means may have transfer means for transferring the electronic note it stores itself to a recording medium readable by a computer;

and

at least one of the electronic note using means may have transferee means for acquiring the electronic note transferred to the recording medium.

5   This structure permits electronic notes to be transferred via an external recording medium provided outside this electronic commerce system.

In this case, the electronic commerce system may be designed in such a way that each of the electronic note

10   using means has means for encrypting the electronic note with an encryption key specific to each electronic note using means;

the electronic note using means having the transfer means has means for supplying first transfer data

15   indicative of the electronic note to be transferred to the recording medium, to the electronic note generation means;

the electronic note using means having the transferee means has means for supplying second transfer data indicative of. the electronic note acquired from the

20   recording medium, to the electronic note generation means; and

the electronic note generation means has means for determining if the first and second transfer data represent substantially the same electronic note, and, when

25   determining that such representation is true, generating and supply an electronic note of an amount substantially equal to the amount of the electronic note indicated by the

second transfer data, to the electronic note using means
to which the second transfer data has been supplied.

This structure prevent unauthorized copying of an
electronic note recorded on a recording medium.

5   The electronic note generation means may include means
for transferring generation request form data representing
a form to fill in predetermined items including the
authorization information and the predetermined amount, to
the electronic note using means; and

10   the electronic note request means may include:

means for displaying the form represented by the
generation request form data on a display screen;

means for acquiring the authorization information and
filling in the predetermined items in the form displayed on

15   the display screen; and

means for transmitting the predetermined items filled
in the form to the electronic note generation means to
thereby request generation of the electronic note.

Alternatively, the contract means may include means

20   for transferring application form data representing an
application form to fill in application items including the
electronic note, to the electronic note using means; and

the contract applying means may include:

means for displaying the application form represented

25   by the application form data on a display screen;

means for acquiring the electronic note and filling in
the application items in the application form displayed on

the display screen; and

means for transmitting the application items filled in the application form, to the electronic note generation means to thereby apply closing of a contract for supply of

5 a commodity.

This structure allows an electronic commerce system to be suitably constituted by using a network system which comprises a web server and clients, like the Internet or an intranet.

10 In the case where this electronic commerce system is constituted by using a network system or the like which comprises a web server and clients, this electronic commerce system should further comprise a server connected to the electronic note request means; and wherein

15 a specific resource locator should be affixed to the generation request form data;

the electronic note request means should have means for transmitting the resource locator to the server; and

the server should have means for acquiring the

20 generation request form data affixed with the resource locator, received from the electronic note request means, from the electronic note generation means and transmitting the generation request form data to the electronic note request means.

25 Alternatively, the electronic commerce system should further comprise a server connected to the contract applying means; and wherein

a specific resource locator should be affixed to the application form data;

the contract applying means should have means for transmitting the resource locator to the server; and

5   the server should have means for acquiring the application form data affixed with the resource locator, received from the contract applying means, from the contract means and transmitting the application form data to the contract applying means.

10   The server may have at least one of the electronic note generation means and the contract means.

The electronic commerce system may be designed in such a way that the contract means includes means for informing the electronic note generation means of information indicating the electronic note presented by the electronic

15   note using means; and

the electronic note generation means includes:

means for storing a list of information showing the generated electronic note; and

20   means for determining if the list contains the information indicating of the electronic note informed by the contract means and informing the contract means of a determination result.

This structure allows the electronic note generation

25   means to check if an electronic note is genuine, and thus enhances transaction safety.

According to the second aspect of this invention,

there is provided an electronic commerce system comprising an electronic note generation section, a commodity providing section and an electronic note storage section connected to one another, in which system

5   the electronic note storage section sends an identification code requesting generation of an electronic note comprised of information representing an amount equal to or smaller than a predetermined credit limit, to the electronic note generation section to request the

10   electronic note generation section to generate the electronic note representing the amount,

the electronic note generation section determines whether or not to generate the electronic note representing the amount based on the identification code received, and

15   generates and supplies the electronic note representing the amount to the electronic note storage section when determining to generate the electronic note,

the electronic note storage section further receives and saves the electronic note representing the amount,

20   reporting an application for supply of a commodity to the commodity providing section and sends information on the saved electronic note to the commodity providing section,

the commodity providing section determines whether or not to accept the application based on the reported

25   application and an amount represented by the electronic note, and, when determining to accept the application, sends an acknowledgement of acceptance to the electronic

note storage section and receives the electronic note representing an amount equivalent to a corresponding value of the commodity from the electronic note storage section.

According to this electronic commerce system, an electronic note itself represents a property value. As the electronic note that is generated by the electronic note generation means is made substantially irrelevant to the identification code and the identification code is circulated while securing anonymity, a contract for supply of a commodity is made while keeping the anonymity of the generator of the electronic note and old participants who dealt with the electronic note.

According to the third aspect of this invention, there is provided an electronic commerce system comprising an information generation section, a commodity providing section, an information storage section and a network connected to one another, in which system

the information storage section sends an identification code requesting generation of an electronic note comprised of information representing an amount equal to or smaller than a predetermined credit limit, and an application for supply of a commodity to the commodity providing section,

the commodity providing section receives the application and the identification code and sends the received identification code to the information generation section to request the information generation section to

generate the information representing an amount equivalent to a corresponding value of the commodity,

the information generation section determines whether or not to generate the information representing the amount equivalent to the corresponding value based on the received identification code, and generates and supplies the information representing the amount equivalent to the corresponding value to the commodity providing section when determining to generate the electronic note,

the commodity providing section receives the information representing the amount equivalent to the corresponding value, determines whether or not to accept the application based on the received application and the information representing the amount equivalent to the corresponding value, and, when determining to accept the application, sends an acknowledgement of acceptance to the information storage section.

According to this electronic commerce system, as the information that is generated by the information generation section is made substantially irrelevant to the identification code and the identification code is circulated with anonymity maintained, a participant who knows the identification code closes a contract for supply of a commodity whose price lies under the predetermined amount. At this time, it is possible to keep the anonymity of the participant who knows the identification code.

For the identification code to represent the correct

balance, for example, the information generation section
may have means for storing an amount obtained by
subtracting the amount equivalent to the corresponding
value from the credit limit indicated by the identification

5   code as a new credit limit, when determining to generate
the information representing the amount equivalent to the
corresponding value.

According to the fourth aspect of this invention,
there is provided an electronic commerce system comprising

10 an electronic note generation section, a plurality of an
electronic note exchange sections and a network, the former
two connected to one another via the network, in which
system

each of the electronic note exchange sections sends an

15 identification code requesting generation of an electronic
note comprised of information representing a predetermined
amount, to the electronic note generation section to
request the electronic note generation section to generate
the electronic note representing the amount,

20   the electronic note generation section determines
whether or not to generate the electronic note representing
the amount based on the identification code received, and
generates and supplies the electronic note representing the
amount to the electronic note storage section that has sent

25 the identification code, when determining to generate the
electronic note,

each of the electronic note exchange sections further

receives and saves the electronic note representing the

amount from the electronic note generation section, sends

information on the saved electronic note to the other

electronic note exchange sections, receives information

indicative of the electronic note from the other electronic

5 note exchange sections, determines whether or not to accept

the electronic note based on the received information

indicative of the electronic note, and, when determining to

receive the electronic note, receives the electronic note.

According to this electronic commerce system, an

10 electronic note itself represents a property value. As the

electronic note that is generated by the electronic note

generation means is made substantially irrelevant to the

identification code and the identification code is

circulated while securing anonymity, the electronic note is

15 exchanged while keeping the anonymity of the generator of

the electronic note and old participants who dealt with the

electronic note.

According to the fifth aspect of this invention, there

is provided a recording medium having stored a program for

20 allowing a computer, connected via a network to electronic

note request means for presenting authorization information

representing a generation request for an electronic note or

an electronic representation of money to request generation

of an electronic note of a predetermined amount, to

25 function as electronic note generation means for accepting

presentation of the authorization information and a request

for generation of the electronic note, determining if the presented authorization information represents a generation request for an electronic note of an amount equal to or greater than the predetermined amount, and, when determining such representation is true, generating and supplying the electronic note of the predetermined amount to the sender of the authorization information.

The computer which runs a program stored in this recording medium makes an electronic note representing a property value substantially irrelevant to the authorization information, so that the anonymity of the generator of the electronic note is maintained by circulating the authorization information with anonymity held.

According to the sixth aspect of this invention, there is provided a recording medium having stored a program for allowing a computer, connected via a network to contract applying means for presenting an electronic note or an electronic representation of money to apply for closing of a contract, to function as contract accepting means for detecting presentation of the electronic note and an application for closing of the contract from the contract applying means, and receiving an electronic note which belongs to the presented electronic note and has an amount equivalent to a price of the commodity.

The computer which runs a program stored in this recording medium receives an electronic note representing a

property value and closes a contract for supply of a commodity. By circulating the electronic note with anonymity kept, a contract for supply of the commodity is made while keeping the anonymity of old participants who

5   dealt with the electronic note.

According to the seventh aspect of this invention, there is provided a recording medium having stored a program for allowing a computer, connected via a network to electronic note generation means for accepting presentation

10   of authorization information representing a generation request for an electronic note or an electronic representation of money and a request for generation of the electronic note, determining if the authorization information represents a generation request for an

15   electronic note of an amount equal to or greater than a predetermined amount, and, when determining such representation is true, generating and supplying the electronic note of the predetermined amount to electronic note using means, and contract accepting means for

20   detecting presentation of the electronic note and an application for closing of a contract and receiving an electronic note which belongs to the presented electronic note and has an amount equivalent to a price of the commodity, to function as

25   electronic note request means for receiving the authorization information and presenting the authorization information to the electronic note generation means to

request generation of the electronic note of the predetermined amount, and contract applying means for receiving and saving the electronic note from the electronic note generation means and presenting the electronic note to the contract

5   accepting means to apply for the contract.

This electronic commerce system acquires an electronic note which represents a property value and is generated as substantially irrelevant to the authorization information, and asks the contract accepting means for supply of a

10 commodity by using the electronic note that is generated from the electronic note generation means. By circulating the authorization information with anonymity maintained, therefore, a commercial transaction using an electronic note is made while keeping the anonymity of the generator

15 of the electronic note and old participants who dealt with the electronic note.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram illustrating the fundamental structure of an electronic commerce system according to one

20 embodiment of this invention;

FIG. 2 is a block diagram showing the logical structure of the electronic commerce system embodying this invention;

FIG. 3 is a flowchart illustrating a process of an

25 electronic note generation program;

FIG. 4 is a flowchart illustrating a process of an

electronic note request program;

FIG. 5 is a flowchart illustrating a process of a transaction program;

FIG. 6 is a flowchart illustrating a process of a transaction request program;

FIG. 7 is a flowchart illustrating a process of an electronic note separation program;

FIG. 8 is a diagram depicting a modification of the electronic commerce system shown in FIG. 1;

FIG. 9 is a diagram showing another modification of the electronic commerce system shown in FIG. 1;

FIG. 10 is a diagram showing yet another modification of the electronic commerce system shown in FIG. 1;

FIG. 11 is a diagram showing a further modification of the electronic commerce system shown in FIG. 1;

FIG. 12 is a diagram depicting yet a further modification of the electronic commerce system shown in FIG. 1;

FIG. 13 is a diagram illustrating procedures of storing an authentication code on a recording medium and making a transfer according to the electronic commerce system embodying this invention;

FIG. 14 is a diagram exemplary showing the data structure of an authentication code; and

FIG. 15 is a diagram of a CD-ROM for storing a program which allows a computer to serve as the electronic commerce system embodying this invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An electronic commerce system embodying this invention will now be described.

FIG. 1 exemplifies the structure of the electronic commerce system according to one embodiment of this invention.

As illustrated, this electronic commerce system comprises an electronic note generation site 1, a transaction site 2, an electronic note user site 3 and a network 4.

The network 4 is the Internet or the like which intermediates among the electronic note generation site 1, the transaction site 2 and the electronic note user site 3.

The electronic note generation site 1 includes a computer 11, an external storage device 12, a network access device 13. The electronic note generation site 1 is given a specific address for the network 4 to specify the site 1. When the network 4 is the Internet, the address is a URL (Uniform Resource Locator), for example.

The computer 11 is connected to the network 4 via the network access device 13 which is comprised of a terminal adapter or the like. The computer 11 receives an exchange value unit identification code 71 (which will be discussed later) from the electronic note user site 3 that is connected to the computer 11 over the network 4, and runs an electronic note generation program 52 to be discussed later.

The external storage device 12, which comprises a hard disk drive or the like, carries out processes, such as data storage, erasure and output of the stored contents, under the control of the computer 11.

The transaction site 2, connected to the network 4, comprises a computer 21, an external storage device 22 and a network access device 23. A specific address is also given to the transaction site 2.

The computer 21 is connected to the network 4 via the network access device 23 which is comprised of a terminal adapter or the like. The computer 21 receives an authentication code 73 (which will be discussed later) from the electronic note user site 3 that is connected to the computer 21 over the network 4, and runs a transaction program 53 to be discussed later.

The external storage device 22, which comprises a hard disk drive or the like, performs processes, such as data storage, erasure and output of the stored contents, under the control of the computer 21.

The electronic note user site 3 comprises a controller 31, an external storage device 32, a network access device 33, a display device 34 and an input device 35. The electronic note user site 3 is likewise given a specific address.

The controller 31, comprising a central processing unit (CPU), etc., is connected to the network 4 via the network access device 33 which is comprised of a modem or

the like. The controller 31 runs an electronic note request program 54, a transaction request program 55, network link programs 51a to 51c and decoding programs 56a to 56c, all of which will be discussed later.

The external storage device 32, which comprises a hard disk drive or the like, carries out processes, such as data storage, erasure and output of the stored contents, under the control of the controller 31.

The input device 35 comprises a keyboard, a mouse and the like. The input device 35 is used to permit an operator to make inputs and sends a signal representing the input information to the controller 31.

As shown in FIG. 2, from the logical point of view, this electronic commerce system comprises the electronic note generation program 52, the transaction program 53, the network link programs 51a-51c, the electronic note request program 54, the transaction request program 55, the decoding programs 56a-56c, the exchange value unit identification code 71, an exchange value unit list 72, the authentication code 73, and an electronic note list 74.

The network link programs 51a-51c are respectively stored in the external storage devices 12, 22 and 32 of the electronic note generation site 1, the transaction site 2 and the electronic note user site 3, and are read out and run by the computers 11 and 21 and the controller 31.

The network link programs 51a-51c respectively control the network access devices 13, 23 and 33 to connect the

computers 11 and 21 and the controller 31 to one another over the network 4.

The electronic note request program 54, stored in the external storage device 32 of the electronic note user site 3, is read and run by the controller 31.

The electronic note request program 54 requests the electronic note generation site 1, connected thereto by the network link programs 51a-51c, to generate an electronic note. The electronic note request program 54 stores the received authentication code 73 into the external storage device 32.

The transaction request program 55, stored in the external storage device 32 of the electronic note user site 3, is read and run by the controller 31.

The transaction request program 55 request the transaction site 2 for a transaction for receiving of a commodity, and sends the authentication code 73 there. Then, the transaction request program 55 acquires information indicating the results of the transaction request from the transaction site 2 and stores it in the external storage device 32.

The decoding programs 56a-56c are designed to extract information of the amount of an electronic note from the authentication code 73.

The decoding programs 56a-56c, respectively stored in the external storage devices 12, 22 and 32, are read and run by the computers 11 and 21 and the controller 31.

The electronic note generation program 52 determines whether or not to issue the authentication code 73 based on the exchange value unit identification code 71 input to the computer 11 from the controller 31 of the electronic note

5   user site 3. When issuance is determined, the electronic note generation program 52 determines the amount of an electronic note to be generated and prepares the authentication code 73 which represents an electronic note of that amount. Then, the electronic note generation

10   program 52 sends the produced authentication code 73 over the network 4 to the electronic note user site 3.

The transaction program 53, stored in the external storage device 22 of the transaction site 2, is read and run by the computer 21.

15   The transaction program 53 determines whether or not to provide a commodity based on the authentication code 73 supplied to the computer 21 from the controller 31 of the electronic note user site 3. When a commodity should be provided, the transaction program 53 informs the electronic

20   note user site 3 of the provision of the commodity.

When the amount of the supplied electronic note exceeds the price of the commodity, the transaction program 53 sends the authentication code 73 of the electronic note to be separated and information specifying the amount of

25   each electronic note prepared as a result of the separation, to the electronic note generation site 1 in order to request the electronic note generation site 1 to produce an

electronic note of the excess amount. Then, the transaction program 53 receives each electronic note prepared as a result of the separation from the electronic note generation site 1, and sends the authentication code

5   73 representing the electronic note equivalent to the excess amount that should be returned to the user, to the electronic note user site 3 over the network 4.

The electronic note separation program 57, stored in the external storage device 12 of the electronic note

10   generation site 1, is read and run by the computer 11.

Upon reception of the request for separation of an electronic note from the computer 21, the electronic note separation program 57 separates the electronic note, indicated by the authentication code 73 sent from the

15   computer 21, by a separation scheme which is specified by the host computer. The authentication code 73 which indicates the resultant separated electronic note is sent over the network 4 to the transaction site 2.

Each of the electronic note generation program 52, the

20   electronic note request program 54, the transaction program 53 and the transaction request program 55 terminates its process when termination of the process is externally instructed, regardless of the subsequent processing.

The exchange value unit identification code 71

25   functions as an evidence of authorization to the electronic note generation site 1 to generate an electronic note, and is previously generated by a manager or the like at the

electronic note generation site 1. This identification

code 71 is recorded in the form directly unviewable by a

person; for example, it may be printed on paper and then

light-shielded. This identification code 71 is to be

5   transferred together with the medium carrying this code.

There is an upper limit to the amount of an electronic

note whose generation can be requested. Hereinafter, the

upper limit of the amount of an electronic note whose

generation can be requested per each authorization is

10   called "exchange value unit."

The exchange value unit list 72 is information which

represents the initial balance of the exchange value unit

of the authorization, indicated by each exchange value unit

identification code 71, and the current balance, and is

15   stored in the external storage device 12 of the electronic

note generation site 1.

The exchange value unit list 72 consists of a

plurality of records each of which contains the exchange

value unit identification code 71, information about the

20   initial balance of the exchange value unit of the

authorization indicated by that identification code 71, and

information about the current balance.

The authentication code 73 represents an electronic

note itself, and is generated by the electronic note

25   generation program 52 as mentioned above.

The authentication code 73 consists of encoded

information on what results from combining information

specifying an electronic note and information representing

the amount of an electronic note by using a predetermined

scheme. Further, the authentication codes 73 differ from

one another.

5   The electronic note list 74, which includes

information of an electronic note which is currently

circulated, is stored in the external storage device 2 of

the electronic note generation site 1 and is used to

discriminate whether or not an electronic note is valid.

10   The electronic note list 74 consists of a plurality of

records each of which contains the authentication code 73

representing the circulated valid electronic note and

information on the amount of that electronic note.

The operation of this electronic commerce system will

15   now be explained with reference to FIGS. 3 through 7.

FIG. 3 is a flowchart illustrating the process of the

electronic note generation program 52, FIG. 4 is a

flowchart showing the process of the electronic note

request program54, FIG. 5 is a flowchart depicting the

20   process of the transaction program53, FIG. 6 is a flowchart

showing the process of the transaction request program55,

and FIG. 7 is a flowchart illustrating the process of the

electronic note separation program.

Process to Generate Electronic Money

25   The following will discuss a process for the

electronic note generation site 1 to generate a new

electronic note and a process for the electronic note user

site 3 to receive the electronic note.

When activated, the computer 11 at the electronic note generation site 1 invokes the network link program 51a to connect itself to the network 4. Then, the computer 11

5 invokes the electronic note generation program 52 shown in FIG. 3.

When the electronic note generation program 52 is activated, the computer 11 determines if connection to another site has been established (S101).

10 When it is determined that such connection is not established, the computer 11 repeats the process of step S101. When establishment of the connection is determined, the computer 11 proceeds to step S102 which will be discussed shortly.

15 When the controller 31 at the electronic note user site 3 externally receives an instruction for connection to the network 4, the controller 31 invokes the network link program 51c to connect itself to the network 4, then invokes the electronic note request program 54. Then, the

20 controller 31 initiates the process illustrated in FIG. 4.

When the controller 31 starts the process in FIG. 4, the controller 31 generates a connection request to the computer 11 of the electronic note generation site 1 in accordance with the process of the network link program 51c

25 (S201).

The computer 11 which has received the connection request establishes connection to the controller 31 and

sends a signal acknowledging the connection to the controller 31 in step S102.

Next, the computer 11 sends information which represents an image requesting the input of the exchange value unit identification code 71 to the controller 31 (S103).

After having issued the connection request and when receiving the connection acknowledging signal, the controller 31 starts receiving information sent from the electronic note generation site 1 (S202). Upon reception of the information which represents an image requesting the input of the exchange value unit identification code 71, the controller 31 displays the image on the display device 34 (S203).

When the image requesting the input of the exchange value unit identification code 71 is displayed, the controller 31 accepts the input of the exchange value unit identification code 71 which is made through the input device 35, and determines if the input has been completed (S204).

When determining that the input has not been completed, the controller 31 repeats the process of step S204. When determining that the input has been completed, the controller 31 sends the input exchange value unit identification code 71 to the computer 11 (S205).

The computer 11 which has received the exchange value unit identification code 71 searches the exchange value

unit list with this identification code 71 as a key to determine whether or not there is a record which includes the same code as the identification code 71 (S104).

When it is determined that there is no corresponding
5   record, the computer 11 sends the controller 31 information representing an image to report that the exchange value unit identification code 71 is an invalid code (S105), and returns to step S103.

When it is determined that a corresponding record
10   exists, the computer 11 sends the controller 31 information representing an image requesting the input of the amount of an electronic note whose generation is requested (S106), then goes for the process starting at step S107, which will be discussed later.

15   When outputting the exchange value unit identification code 71, the controller 31 receives information showing the result of authentication of the exchange value unit identification code 71, i.e., the information that has been sent to the controller 31 from the computer 11 in step S105
20   or S106, and displays the image represented by that information on the display device 34 (S206).

Next, the controller 31 determines if the exchange value unit identification code 71 that was input in step S204 has been determined as invalid, from the information
25   input in step S206 (S207).

When the exchange value unit identification code 71 has been determined as invalid, the controller 31 goes to

step S203. When the exchange value unit identification code 71 has been determined as valid, on the other hand, the controller 31 accepts the input of the amount of an electronic note whose generation the user desires, and

5 determines if the input has been completed (S208).

When determining that the input has not been completed, the controller 31 repeats the process of step S208. When determining that the input has been completed, the controller 31 sends information representing the amount of

10 electronic note requested to the computer 11 (S209).

In step S107, the computer receives the information indicating the amount of an electronic note whose generation the user requested. Then, from the record sought out in step S104, the controller 31 reads the current

15 balance of the exchange value unit indicated by this record (S108).

Next, based on the amount input in step S107 and the balance of the current exchange value unit read in step S108, the computer 11 determines if the amount of an

20 electronic note whose generation the user requested exceeds the balance of the current exchange value unit (S109).

When determining that the former amount exceeds the latter balance, the computer 11 sends information representing an image which informs an insufficient balance

25 and request reinput of an amount to the controller 31 (S110), and returns to step S106.

When determining that no exceeding occurs, the

computer 11 generates information which specifies a new electronic note and information representing an amount equal to the amount input by the user (S111). Then, both information are combined by a predetermined scheme and the

5   resultant information is then encoded by a predetermined scheme, thus yielding an authentication code 73. Further, the balance of the exchange value unit recorded in the record that has been sought out in step S104 is updated to the user input amount deducted from this balance (S112).

10   Then, a new record is put in the electronic note list 74, the generated authentication code 73 and the information of the amount of an electronic note generated are stored in that record, and then the generated authentication code 73 is sent to the controller 31 (S113).

15   After sending the information representing the amount of an electronic note whose generation is requested by the user to the computer 11, the controller 31 acquires the information sent to itself from the computer 11 (S210) and determines if generation of an electronic note has been

20   conducted (S211).

When determining that generation of an electronic note has not been carried out, the controller 31 displays the image represented by the information sent from the computer 11 in step S110 (i.e., the image request reinput of the

25   amount of an electronic note) on the display device 34 (S212) and returns to step S208.

When determining that generation of an electronic note

has been carried out, the controller 31 writes the
authentication code 73, sent from the computer 11 in step
S113, into the external storage device 32 (S213).

Then, the controller 31 runs the decoding program 56c
to acquire the amount of each electronic note indicated by
the authentication code 73 stored in the external storage
device 32 (S214).

Then, the controller 31 displays the acquired amount
of each electronic note on the display device 34 (S215),
and request the computer 11 for disconnection from the
electronic note generation site 1 (S216).

The computer 11 which has received the disconnection
request sends a signal acknowledging disconnection to the
controller 31 (S114), and returns to S101.

Upon reception of the disconnection acknowledgment
(S217), the controller 31 terminates the electronic note
request program 54.

Through the above-described processing, the exchange
value unit identification code 71 is sent to the electronic
note generation site 1 from the electronic note user site 3,
and when the presence of the exchange value unit of the
authorization indicated by this identification code 71 is
confirmed, the electronic note user site 3 can request
generation of an electronic note which does not exceeds the
balance of the exchange value unit.

Then, the electronic note generation site 1 generates
the electronic note whose amount does not exceeds the

balance of the exchange value unit, and produces and sends

the authentication code 73 indicating that electronic note

to the electronic note user site 3, which in turn receives

and stores the authentication code 73.

5   Process to Utilize Electronic Money

A description will now be given of a process of

allowing the user to use the acquired electronic note.

When activated, the computer 21 at the transaction

site 2 invokes the network link program 51b to connect

10   itself to the network 4. Then, the computer 21 invokes the

transaction program 53 shown in FIG. 5.

When the transaction program 53 is activated, the

computer 21 determines if connection to another site has

been established (S301).

15   When it is determined that such connection is not

established, the computer 21 repeats the process of step

S301. When establishment of the connection is determined,

the computer 21 goes for the process starting at step S302

which will be discussed shortly.

20   When the controller 31 at the electronic note user

site 3 externally receives an instruction for connection to

the network 4, the controller 31 invokes the network link

program 51c to connect itself to the network 4, then

invokes the transaction request program 55. Then, the

25   controller 31 executes the process illustrated in FIG. 6.

When the controller 31 starts the process in FIG. 6,

the controller 31 generates a connection request to the

computer 21 of the transaction site 2 in accordance with the process of the network link program 51c (S401).

The computer 21 which has received the connection request establishes connection to the requester and sends a signal acknowledging the connection to the requester in step S302.

Next, the computer 21 requests the controller 31 to sent the authentication code 73 which is currently stored in the external storage device 32 (S303).

After having made the connection request and when receiving the connection acknowledging signal, the controller 31 starts receiving information sent from the transaction site 2 (S402).

Upon reception of the request for the transmission of the authentication code 73 from the computer 21, the controller 31 reads the authentication code 73 currently stored in the external storage device 32 and sends it to the computer 21 (S403).

Upon reception of the authentication code 73 (S304), the computer 21 invokes the decoding program 56b and acquires the amount of an electronic note, indicated by each received authentication code 73, in accordance with the process of the decoding program 56b (S305).

Then, the computer 21 sends the controller 31 information on the total of the amount acquired in step S305, information on an image which explains commodities which can be purchased within the total amount, and

information on an image requesting selection of a
commodity to be purchased (S306).

Upon reception of those three information, the
controller 31 displays the amount of each electronic note
on the display device 34 as well as the image explaining
the individual commodities and the image requesting
selection of a commodity (S404).

The controller 31 accepts the input of information on
selection of any commodity, which is made through the input
device 35, and determines if the input has been completed
(S405).

When determining that the input has not been completed,
the controller 31 repeats the process of step S405.

When determining that the input has been completed,
the controller 31 sends the information indicating any
selected commodity, which has been input in step S405, to
the computer 21 (S406).

The computer 21 which has received the information
indicating any selected commodity stores that information
in the external storage device 32 (S307) and acquires the
total of the selected commodities (S308).

Then, the computer determines a set of electronic
notes from each electronic note obtained in step S305
(S309).

This set is determined in such a way that the sum of
the amounts of electronic notes belonging to this set is
greater than the total acquired in step S308 and the sum of

the amounts of the electronic notes remaining after excluding any single electronic note from the set is smaller than the total computed in step S308.

Then, the computer 21 further selects another arbitrary one of all the electronic notes belonging to the selected set (S310), and acquires the total of the remaining electronic notes excluding the one selected in step S310 (S311).

Then, the computer 21 generates information representing what results from subtraction of the total acquired in step S311 from the amount computed in step S308 (S312).

Next, the computer 21 connects to the computer 11 of the electronic note generation site 1 over the network 4 (S313). Then, the computer 21 sends the computer 11 information on the difference obtained in step S312, the authentication code 73 representing the electronic note further selected in step S310, information about the amount of that electronic note and a signal requesting separation of said electronic note (S314).

Upon reception of those information and the separation requesting signal, the computer 11 commences the electronic note separation program 57 shown in FIG. 7.

After starting the electronic note separation program 57, the computer 11 searches the electronic note list 74 for the record that including the received authentication code 73, and deletes this record from the list 74 (S501).

Next, the computer 11 generates information which specifies a new electronic note whose amount is equal to the amount difference indicated by the information received from the computer 21 (S502). Then, the computer 11 combines this information and the information on the difference received from the computer 21 and encodes the resultant information, both by the same schemes as are used in step S112 by the electronic note generation program 52, thus generating an authentication code 73 (S503).

Then, the computer 11 generates a new record in the electronic note list 74 and stores information specifying the new electronic note and information on the difference, received from the computer 21, in that record (S504).

The computer 11 then acquires a difference between the amount of the electronic note deleted from the electronic note list 74 and the amount of the electronic note generated in step S503 (S505).

Then, generation of the authentication code 73 which represents the electronic note whose amount equals the difference and recording of information of that electronic note in the electronic note list 74 are carried out in the same procedures as done in steps S502-S505 (S506).

The computer sends the information on the amounts of two electronic notes and the two authentication codes 73, generated in steps S502 and S503 and step S506, to the computer 21 (S507), then terminates the electronic note separation program 57.

When receiving the authentication codes 73 representing the two electronic notes and the information on the amounts of those electronic notes (S315), the computer 21 terminates connection to the electronic note generation site 1 (S316). Then, the computer 21 sends the authentication code 73 representing an electronic note belonging to the currently selected set of electronic notes, and information about acceptance of a contract for supply of a commodity and representing erasure of this authentication code 73 to the controller 31 (S317).

The controller 31, which has received the request to erase the authentication code 73 and the authentication code 73 to be erased, deletes this authentication code 73 from the external storage device 32 (S407) and sends an acknowledgement of the completion of deletion to the computer 21 (S408).

Upon reception of the acknowledgement of deletion completed, the computer 21 sends the controller 31 the authentication code 73 for the electronic note whose amount differs from the differential amount, acquired in step S312, and information indicating the amount of the electronic note that is indicated by that authentication code 73 (S318). Note that when the amounts of two electronic notes received in step S315 are equal to each other, any single authentication code 73 should be sent.

The controller 31 which has received the authentication code 73 and the information on the amount

stores the authentication code 73 in the external storage device 32 and displays that amount on the display device 34 (S409). Then, the controller 31 sends a signal requesting disconnection to the host computer (S410).

The computer 21 which has received the disconnection request sends controller 31 a signal acknowledging disconnection (S319), and returns to S301.

Upon reception of the disconnection acknowledgment (S411), the controller 31 terminates the transaction request program 55.

Through the above-described processing, the authentication code 73 is sent to the transaction site 2 from the electronic note user site 3, and when validation of the electronic note indicated by this authentication code 73 is confirmed, the electronic note user site 3 can make a contract for provision of any commodity, presented by the transaction site 2, within the range whose upper limit is the total amount of electronic notes.

When a commodity is selected at the electronic note user site 3, the transaction site 2 sends an acknowledge of acceptance of the selection to the electronic note user site 3. Then, the transaction site 2 confirms that that of the electronic note present at the electronic note user site 3 which has been presented to the transaction site 2 for the selected commodity has been deleted, and then sends an electronic note corresponding changes to the electronic note user site 3.

The transaction site 2 and the electronic note user site 3 can reuse the authentication code 73 they are holding, as a price for a transaction, and can also show the authentication code 73 to the manager or the like at

5 the electronic note generation site 1 and ask for payment of money equivalent to the amount indicated by the presented information.

The electronic note generation site 1 and the transaction site 2 may share a computer and an external

10 storage device, or the transaction site 2 and the electronic note user site 3 may likewise share a computer and an external storage device.

The electronic note generation program 52 and the transaction program 53 need not be separate programs, so

15 that a transaction for provision of a commodity may directly follow the generation of an electronic note.

If supply of a commodity can be performed directly at the transaction site 2, the transaction program 53 may not only accept supply of the commodity but also may include a

20 process of supplying the commodity.

When a commodity to be supplied is shareware, for example, the computer 21 may download the shareware to the electronic note user site 3 in the aforementioned step S318 in accordance with the process of the transaction program

25 53.

Further, as shown in FIG. 8, the transaction site 2 may acquire the exchange value unit identification code 71

from the electronic note user site 3 at the time of making a transaction and may request the electronic note generation site 1 to generate an electronic note whose amount is equivalent to the value of the commodity to be

5   provided, and the electronic note generation site 1 may generate the electronic note of the amount and send the authentication code 73 for that electronic note to the transaction site 2.

In the case where the transaction site 2 acquires the

10   exchange value unit identification code 71 and makes a transaction, as shown in FIG. 9, the electronic note generation site 1 need not generate an electronic note, may deduct an amount equivalent to the price for a commodity from the current amount of the exchange value unit when

15   informed of the deduction and may report the transaction site 2 to the effect that the deduction has been executed.

Specifically, for example, if information for selecting a commodity to be purchased is sent to the transaction site 2 which is open as a home page in the

20   Internet, and the exchange value unit identification code 71 described on scratch paper is sent to the transaction site 2, the amount of the exchange value unit may be reduced by the price for the commodity.

In this case, the transaction site 2 may simply inform

25   the electronic note generation site 1 of the reduction of the amount of the exchange value unit, or the transaction site 2 may refer to the electronic note generation site 1

for the balance of the exchange value unit and the electronic note generation site 1 may decide the reduction of the balance and inform the transaction site 2 of that event.

5   Further, the processes which are performed by the electronic note generation program 52, the transaction program 53, the electronic note request program 54, the transaction request program 55 and the electronic note separation program 57 are not limited to those shown in

10   FIGS. 3 to 7.

For instance, the information which is sent to the controller 31 from the computer 11 in accordance with the process of the electronic note generation program 52 and the information which is sent to the controller 31 from the

15   computer 21 in accordance with the process of the transaction program 53 may both include documents described according to the HTML (HyperText Makeup Language).

When the information to be sent to the electronic note user site 3 includes such a document, the electronic note

20   request program 54 and the transaction request program 55 may be software (browser) for browsing documents.

In this case, the electronic note generation site 1, the transaction site 2 and the electronic note user site 3 are connected over the network to a WWW (World Wide Web)

25   server as shown in, for example, FIG. 10 to execute the operations which will be explained below.

First, the electronic note user site 3 requests the

electronic note generation site 1 or the transaction site 2 to transmit a document representing the form for inputting information the user will supply to the electronic note generation site 1 and the transaction site

5   2, via the WWW server in accordance with, for example, an instruction from the user who manipulates the electronic note user site 3.

Specifically, for example, the electronic note user site 3 supplies a URL identifying the form document to the

10   WWW server to request transmission of the document.

The form document includes data about a text box for the user to write a string of characters and the URL (link information) indicating the destination of data written by the user in the text box.

15   The text box included in a document to be supplied from the electronic note generation site 1 includes a text box to write the exchange value unit identification code 71 and a text box to write the exchange-value requested amount. The text box included in a document to be supplied from the

20   transaction site 2 includes a text box to write the authentication code 73 and a text box to write information for selecting a commodity. The destination indicated by link information coincides with the sender of the document itself which includes that link information.

25   Upon reception of the URL of the document whose transmission is requested, the WWW server accesses the electronic note generation site 1 and the transaction site

2 which retain that document, acquires the requested document and returns it to the electronic note user site 3.

When acquiring the document via the WWW server, the controller 31 of the electronic note user site 3 displays

5   the image represented by the obtained document on the display device 34 in accordance with the browser's process to accept movement of the cursor and mouse pointer, inputting of a string of characters at the cursor position and inputting of a signal made by clicking of the mouse

10   button.

When a string of characters is input at the cursor position, the controller 31 displays the input character string at the cursor position on the display screen of the display device 34. When the area on the display screen

15   where link information is clicked, the controller 31 sends the WWW server that link information (i.e., the URL of the electronic note generation site 1 or the transaction site 2 which is the sender of the currently displayed document) and a string of characters which have been input up to the

20   clicking time and is currently displayed on the display device 34.

Upon reception of the link information and the character string, the WWW server sends the received character string to the electronic note generation site 1

25   or the transaction site 2 that is indicated by the link information.

The electronic note generation site 1 receives the

character string supplied from the electronic note user
site 3 via the WWW server and analyzes its contents to
acquire the exchange value unit identification code, the
exchange-value requested amount and other information

5   supplied from the electronic note user site 3. The
transaction site 2 receives the character string supplied
from the electronic note user site 3 via the WWW server and
analyzes its contents to acquire the authentication code,
information indicating the selected commodity and other

10   information supplied from the electronic note user site 3.
Then, the computer 11 of the electronic note generation
site 1 accepts a request to generate an electronic note,
determines whether or not to generate the authentication
code 73, and carries out the generation and supply of the

15   authentication code 73 to the electronic note user site 3,
or accepts an application for provision of a commodity,
determines whether or not to provide the commodity, reports
the determination result, separates an electronic note and
sends separated electronic notes to the transaction site 2.

20   The electronic note generation site 1 and the
transaction site 2 may supply documents directly to the
electronic note user site 3 without intervening the WWW
server, and the electronic note user site 3 may send a
document transmission request directly to the electronic

25   note generation site 1 and the transaction site 2 without
intervening the WWW server.

         The documents to be transmitted to the electronic note

user site 3 from the electronic note generation site 1 and the transaction site 2 need not be described according to the HTML.

After receiving the documents supplied from the

5   electronic note generation site 1 and the transaction site 2 and displaying them, the controller 31 of the electronic note user site 3 may accept, for example, displays the image represented by the obtained document on the display device 34 in accordance with the browser's process to

10   accept movement of the cursor and mouse pointer, and may send the input character string, information on the position of the cursor on the image at the time the character string has been input, information on the position of the mouse pointer on the image when the mouse

15   is clicked, and information on the scroll status for the image currently displayed on the display device 34, to the sender of the information of the hypertext, currently displayed on the display device 34, as needed.

In this case, the electronic note generation site 1

20   and the transaction site 2 should analyze the information supplied from the electronic note user site 3, such as the character string and information which represents the cursor position, the position of the mouse pointer, and the image scroll status, to acquire the exchange value unit

25   identification code, the exchange-value requested amount, the authentication code, information indicating the selected commodity and other information.

The quantities of the electronic note user site 3 and the transaction site 2 need not be one each, but can be set arbitrarily. When the network 4 is the Internet or an intranet and the computer connected to the network 4 has the function of a WWW server, for example, a plurality of home pages may be provided under the control of this computer and each transaction site 2 may be constituted by each home page. Further, this computer may serve as the electronic note generation site 1.

The electronic note user site 3 which receives the exchange value unit identification code 71 need not be the same as the electronic note user site 3 which receives the authentication code that has been generated by the electronic note generation program 52 as a result of the reception of the identification code 71, and there may be an electronic note user site 3 which does not run one of the electronic note request program 54 and the transaction request program 55. The electronic note user site 3 which does not run one of the transaction request program 55 may be an anonymous node or a terminal which is not associated with a specific user.

Each electronic note need not be generated as having an amount equal to an exchange-value requested amount, but may be generated in predetermined separated units of, for example, one cent, five cents, ten cents and so forth, the same way as ordinary money is separated.

The electronic note generation site 1 may separate an

electronic note not only by a request from the transaction

site 2 but also by a request from the electronic note user

site 3 as shown in FIG. 11. The separation of an electronic

note is not limited to the above-described manner, and an

5   electronic note may be separated in predetermined units,

for example, those of ordinary money.

A medium for circulating the exchange value unit need

not be scratch paper, but may be a floppy disk, a CD-ROM or

another non-volatile recording medium. The electronic note

10   user site 3 may further be equipped with a floppy disk

drive, a CD-ROM driver or the like to read the exchange

value unit identification code 71.

The sites which generate an electronic note should not

necessarily be just electronic note generation sites and

15   plural types of sites may exist for the purpose, as long as

an electronic note generated by those sites are not

redundant.

Specifically, a plurality of electronic note

generation sites 1 may be assigned with authentication

20   codes 73 they can generate themselves, and each electronic

note generation site 1 may generate an electronic note

separately from the other electronic note generation sites

1.

As another example where a plurality of sites generate

25   an electronic note, the transaction site 2 which is

authorized by the manager or the like at the electronic

note generation site 1 may separate an electronic note on

its own, as shown in FIG. 11.

When the transaction site 2 separates an electronic note, the transaction site 2 may include information of the authentication code 73 of the electronic note to be

5   separated (i.e., an electronic note which is to be deleted in exchange of generation of two electronic notes) into the separated electronic notes to avoid redundancy of electronic notes.

If the transaction site 2 records an electronic note

10   it holds in its the external storage device 22, this electronic note may be sent as changes to the electronic note user site 3 in the process of utilizing electronic notes.

The transaction site 2 should not necessarily always

15   give an electronic note at the electronic note user site 3 to the electronic note user site 3, but may save it in the external storage device 22 or the like after associating it with identification information of the authorized user of the electronic note, and withdraw it as a transaction

20   oriented value in accordance with a request by the authorized user or return it to that user.

As shown in FIG. 12, for example, the transaction program 53 may include a process of checking the received authentication code 73 against the individual records in

25   the electronic note list 74 at the electronic note generation site 1 to check the received authentication code 73 is valid.

An electronic note may be read from the external storage device 32 of the electronic note user site 3 and recorded on a non-volatile recording medium to be carried around, so that it can be used in a transaction using

5   another electronic note user site 3 or can be transferred without going through the network 4.

When an electronic note is carried out and transferred over no network 4 as mentioned above, copying of an electronic note can be prevented by, for example, handing

10   the authentication code 73 as follows.

In storing the authentication code 73 in the external storage device 32, as shown in FIG. 13, the electronic note user site 3 should encode the authentication code 73 with information specific to each authorized user (e.g., the

15   name) as a key to yield electronic note identifying information different from the authentication code 73 and then should save the information.

At the time an electronic note is recorded on a non-volatile recording medium, the electronic note identifying

20   information is decoded and is recorded as the original authentication code 73. Then, the electronic note user site 3 connects to the electronic note generation site 1 and reports the authentication code 73 of the electronic note that has been carried out from the external storage device

25   32 to the electronic note generation site 1. The electronic note generation site 1 stores the report.

The authentication code 73 recorded on the non-

volatile recording medium is stored in the external

storage device 32 of the electronic note user site 3 by

some operation by a person who is the transferee of the

non-volatile recording medium or a copy of that recording

5   medium, and is encoded with information specific to that

person as a key.

Thereafter, the electronic note user site 3 and the

electronic note generation site 1 are connected together,

and the authentication code 73 transferred from the non-

10   volatile recording medium is reported to the electronic

note generation site 1.

When the electronic note generation site 1 is holding

a report about the electronic note having been carried out

at the time it is informed by the electronic note

15   generation site 1, the site 1 determines that the carry-out

of the electronic note has been cleared.

Then, the electronic note generation site 1 erases the

stored report about the carry-out of the electronic note

and deletes the authentication code 73 of that electronic

20   note from the electronic note list 74. Then, the electronic

note generation site 1 generates a new electronic note

equal in amount to the electronic note that is represented

by the deleted authentication code 73.

The authentication code 73 need not be generated under

25   the condition that a corresponding value should be paid.

For example, the exchange value unit identification code 71

may be distributed free. The transaction site 2 and the

electronic note user site 3 may present the electronic
note generation site 1 with their holding authentication
codes 73 or electronic note identifying information so as
to be able to request an advance payment of money

5   equivalent to the amount that is indicated by the presented
information.

As shown in FIG. 14, for example, the authentication
code 73 may include information representing the date the
authentication code was issued, and every time the

10   authentication code 73 is transferred, corroboration
information consisting of information for identifying the
transferor or the transferee of that authentication code 73
(e.g., the names of those participants or identification
codes previously assigned to those persons) may be added.

15   FIG. 14 shows the data structure of the authentication code
73 in the case where the authentication code 73 is
transferred from the first transferor #1 to the first
transferee #2, then from the second transferor or the first
transferee #2 to the second transferee #3.

20   The corroboration information is added in accordance
with an instruction from the person who transfers the
authentication code 73. To indicate that the corroboration
information has genuinely been added in response to an
instruction from the transferor of the authentication code

25   73, information among those included in the corroboration
information, which is for identifying the transferor of the
authentication code 73, should consist of the electronic

signature of the transferor of the authentication code 73.

The electronic signature consists of a code acquired by encoding an identification code, assigned to the transferor of the authentication code 73, with a secret key assigned to the transferor, and the non-encoded identification code. Whether or not the corroboration information has genuinely been added by the person who has assigned the identification code which has been encoded with the secret key is checked by decoding the encoded identification code using a public key which has previously been associated with the secret key, and checking if the resultant decoded identification code with the non-encoded identification code.

The corroboration information described above allows the electronic note generation site 1 to carry the monetary value of the authentication code 73 which has been issued without a corresponding value, thereby enhancing the creditability of the authentication code 73.

Suppose that when the manager or the like at the electronic note generation site 1 is presented with the authentication code 73 or electronic note identifying information and receives a claim of an advance payment, the manager refuses the advance payment because the first person who got the electronic note represented by the presented information has not paid the corresponding value equivalent to the amount of the electronic note to the manager of the electronic note generation site 1 or some

other reason. In this case, if the corroboration
information is included in the authentication code 73, the
electronic note user site 3 which has presented the
authentication code 73 can specify the old transferee of

5   the authentication code 73 and can ask the specified person
for the payment of the amount represented by the
authentication code 73.

The authentication code 73, which is not limited to
the aforementioned type, may include other arbitrary

10   information than the information that specifies an
electronic note. The individual pieces of information
included in the authentication code 73, excluding the
amount of an electronic note and the electronic note
specifying information, may vary due to the transfer of the

15   authentication code 73, the elapsed time and some other
factors.

For example, the authentication code 73 may include
information on the number of times the authentication code
73 has been transferred since generation, or information

20   indicating the issued time of the authentication code 73 or
the time of its transfer.

As another example, when each electronic note is
transferred to the transaction site 2, the transaction site
2 may request an input of personal information such as the

25   age and a commodity to be purchased, and when the input is
made at the electronic note user site 3, the personal
information may be included in the authentication code 73

for later use in a statistical research or the like.

Further, individual authentication codes 73 may be handled differently according to the contents of the information included in each code.

5   When each authentication code 73 includes information about the number of transfers made since generation, for example, the transaction site 2 may reject a transfer of any authentication code 73 whose number of transfers exceeds ten.

10   Furthermore, when each authentication code 73 includes information of the time of generation, the transaction site 2 may reject a transfer of any authentication code 73 which has passed a predetermined time since generation.

Although one embodiment and several modifications of
15 this invention have been described hereinabove, the electronic commerce system of this invention can be implemented by using an ordinary computer system, not a special-purpose system. For example, the electronic commerce system which carries out the above-described
20 processes can be implemented by installing programs, stored on a medium (e.g., a floppy disk, CD-ROM 8 shown in FIG. 15, or the like), for executing the above-described operations onto a personal computer.

A medium for providing a computer with programs may be
25 a communication medium (any medium which retains programs in temporary and mobile form, such as a communications line, a communications network or a communications system). For

example, the programs may be put on the bulletin board system (BBS) of a communications network and then distributed over the network.

5   The above-described processes can be performed by invoking those programs under the control of the operating system (OS) in the same way as other application programs.

In summary, this invention realizes an electronic commerce system in which electronic representations to be circulated represent property values themselves and which

10   keeps the anonymity of the generator of an electronic representation and old participants who dealt with the electronic note at the time of generating and transferring the electronic representation.